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VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1928-29

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INTRODUCTION

The failure in Louisiana of the so-called noble varieties of sugarcane, due to their susceptibility to mosaic and root diseases, and the introduction by the United States Department of Agriculture of hardier disease-resistant canes resulted in a varietal revolution which is now virtually complete.

With the superiority of these new varieties completely established, attention is drawn more particularly to the important work of properly evaluating the respective merits in the various parts of the cane belt of the four varieties—P. O. J. 36,[2] P. O. J. 36–M, P. O. J. 213, and P. O. J. 234—now released for commercial planting, and the comparative performance of varieties newly imported or bred at the United States Sugar Plant Field Station at Canal Point, Fla.

An additional problem is presented by the fact that the present field practices on Louisiana plantations have been evolved with varieties now discarded and will probably have to be modified in order to obtain the best results with the varieties now being cultivated.

The results of investigations regarding varietal adaptability and certain field practices carried on by the United States Department of Agriculture during the crop year 1928–29 as a part of its investigation program with sugarcanes in Louisiana are summarized in this circular.

SEASONAL CONDITIONS

A considerable excess of rainfall occurred in 1929 throughout the Louisiana cane-growing area. The rainfall during the growing season, while excessive, did not seriously interfere with cultivation. The early spring shortened the usual dormant period and permitted cane to begin growth much earlier than usual. Table 1 shows the

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[2] An explanation of the abbreviations used to designate sugarcane varieties appears as a footnote to Table 2.

amount and distribution of rainfall at the five test fields at which the investigations herein reported were carried on. At Houma the last freezing temperature occurred on February 12, when a minimum temperature of 30° F. was recorded. The early start resulted in most varieties developing a maximum number of stalks per acre at a comparatively early date, thereby reducing the percentage of late green suckers. This condition ordinarily would have resulted in a high percentage of sucrose in the cane at harvest, and analyses made in September and in early October indicated the prospect of a high percentage in 1929. However, excessive rainfall which occurred in October and November not only retarded ripening but in many instances resulted in a distinct lowering of purity. Harvesting operations were so delayed by rains during November that an abnormally large percentage of the crop was still standing on December 4, when temperatures of 24° F. or lower were recorded throughout the cane belt. While it is generally believed that the new varieties withstood these adverse conditions considerably better than could have been expected of the old varieties, the large quantity of frozen cane that had to be milled made it impossible to complete grinding before serious deterioration had taken place. Consequently, sugar recoveries were progressively reduced following the freeze, and finally a considerable portion of the crop had to be abandoned in the fields on account of its poor quality. In spite of shrinkage which occurred as a result of this unusual combination of weather conditions, sugar production for the State is placed at 199,609 short tons,[3] which indicates an increase of 29 per cent over the 10-year average for the period from 1919 to 1928.

TABLE 1.—*Amount and distribution of rainfall at the five sugarcane test fields in Louisiana during 1929*

Station	January		February		March		April		May		June		July	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Erath	5	5.62	6	5.58	4	2.85	4	2.60	9	8.45	5	4.30	7	6.02
Cypremort	6	8.50	7	6.50	2	1.50	4	3.75	5	5.00	7	9.00	12	8.00
Raceland	8	10.38	9	8.11	5	7.02	3	1.94	8	6.22	12	6.23	14	10.09
Greenwood	8	10.57	9	5.57	7	3.95	3	2.20	6	4.06	7	6.33	19	11.86
Houma	8	9.95	11	7.35	4	6.88	2	1.62	8	4.99	8	8.91	20	13.23
Normal for Houma [2]	----	3.64	----	4.41	----	3.29	----	4.01	----	3.51	----	5.50	----	8.77

Station	August		September		October		November		December		Total rainfall	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Erath	7	3.22	5	6.40	2	7.63	10	15.88	4	7.85	68	76.40
Cypremort	8	6.00	4	3.00	3	11.25	8	10.00	5	7.25	71	79.75
Raceland	6	3.25	8	5.70	7	6.71	10	5.38	5	4.04	95	75.07
Greenwood	8	3.23	10	6.93	5	7.33	10	4.89	5	3.72	97	70.64
Houma	10	7.78	7	6.20	5	6.90	10	6.42	5	2.64	98	82.87
Normal for Houma [1]	----	6.09	----	5.71	----	3.43	----	2.71	----	4.75	----	55.82

[2] Normal annual rainfall for other areas in the sugar belt ranges from approximately 55 to approximately 60 inches.

[3] UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF AGRICULTURAL ECONOMICS. LOUISIANA SUGAR AND SIRUP, 1929. U. S. Dept. Agr., Bur. Agr. Econ. [Mimeographed report.] May 22, 1930. This report states that 39,653 acres were abandoned.

EXPERIMENTAL METHODS

Plot arrangement, sugarcane sampling, and statistical methods employed have been described in previous publications.[4] [5] Sugar yields were calculated as described in these publications, using the Winter-Carp (Java) formula and an assumed juice extraction of 78 per cent on weight of cane. Although several varieties reported here have shown significantly higher percentages of fiber than the P. O. J. varieties now being cultivated and would probably give somewhat lower normal extractions than these varieties, no corrections were made in assumed extraction for fiber content because of the insufficient milling data available.

PLANT-CANE VARIETY TESTS

Comparative plantation tests were continued at the United States Sugar Plant Field Station at Houma and on four representative plantations with four released P. O. J. varieties and several others which had shown merit on the basis of preliminary trials. The results of these variety tests are given in Tables 2 to 8, inclusive, with a summary of the results in Table 9.

The comparative results obtained with the four released varieties are, generally speaking, in keeping with those previously obtained and published.

TABLE 2.—*Results of plant-cane variety[a] tests on light soil on the Godchaux plantation, Raceland, La., in 1929; planted October 20, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±0.80 ton]

Variety	Acre yield of cane[b] from—												Average
	Plot[c] 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J 36	23.36	28.36	25.16	26.26	30.76	24.16	29.56	31.56	24.26	27.36	32.76	25.56	27.43
P. O. J. 36–M	32.16	29.76	34.76	33.56	31.16	25.96	32.96	34.96	31.96	26.76	32.96	26.16	31.09
P. O. J. 213	33.40	38.88	44.88	42.88	38.48	34.88	31.88	33.58	39.02	38.88	34.88	34.78	37.26
P. O. J. 234	32.36	26.36	28.76	27.56	27.96	29.16	26.56	26.36	34.36	32.16	29.16	26.36	28.93
C. P. 807	44.42	43.82	45.02	45.02	43.02	42.42	46.22	48.02	43.22	47.42	42.82	41.82	44.43
Co. 281	35.02	51.84	38.04	35.04	36.64	35.02	39.22	40.02	31.32	32.04	29.82	34.64	36.55

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses, Nov. 6			Harvest analyses, Dec. 11					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	13.70	10.07	73.51	14.72	11.62	78.94	152.0	4,169	13.2
P. O. J. 36–M	14.57	11.01	75.57	15.29	12.20	79.79	160.4	4,987	12.5
P. O. J. 213	14.50	11.54	79.59	14.75	11.88	80.54	157.2	5,857	12.7
P. O. J. 234	15.83	12.84	81.11	16.34	14.03	85.86	192.4	5,566	10.4
C. P. 807	14.70	11.63	79.12	14.85	11.95	80.47	157.9	7,015	12.7
Co. 281	15.83	12.84	81.11	16.33	13.82	84.63	187.9	6,868	10.6

[a] Many varieties of sugarcane are commonly designated by letters or other abbreviations indicating the origin of the seedling cane. The meanings of such designations for the varieties mentioned throughout this circular are as follows: Co.=Coimbatore (India) seedling; C. P.=Canal Point (Fla.) seedling; F. M.=Formosa Male seedling; P. O. J.=Proefstation Oest Java seedling; P. O. J. 36–M=Mingka selection of P. O. J. 36.

[b] Tons of 2,000 pounds are used throughout this circular.

[c] Plots of one-fortieth of an acre.

[4] RANDS, R. D., and SHERWOOD, S. F. YIELD TESTS OF DISEASE-RESISTANT SUGARCANES IN LOUISIANA. U. S. Dept. Agr. Circ. 418, 20 p. illus. 1927.

[5] ARCENEAUX, G., and STEVENS, F. D. VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1927–28. U. S. Dept. Agr. Circ. 88, 16 p., illus. 1929.

TABLE 3.—*Results of plant-cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1929; planted October 22, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±1.15 tons]

Variety	Acre yield of cane from—						Average
	Plot [1] 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	42.98	39.38	43.98	39.58	39.18	38.58	40.61
P. O. J. 36–M	40.64	36.44	37.84	42.24	39.84	39.40	39.24
P. O. J. 213	33.78	37.78	39.18	35.78	34.78	33.98	35.88
P. O. J. 234	35.16	34.96	37.56	35.96	30.76	34.16	34.76
P. O. J. 2725		37.96	42.36	47.96	51.96	49.56	45.96
C. P. 177	41.50	42.30	40.90	42.30	42.30	35.70	40.83

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Harvest analyses, Nov. 13			Analyses Dec. 9					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	13.97	10.36	74.16	13.31	9.66	72.58	130.2	5,287	15.4
P. O. J. 36–M	14.13	10.65	75.37	13.49	10.04	74.43	135.4	5,313	14.8
P. O. J. 213	13.84	10.61	76.66	12.31	8.91	72.38	136.2	4,887	14.7
P. O. J. 234	14.05	10.80	76.87	14.23	10.93	76.81	139.1	4,835	14.4
P. O. J. 2725	13.78	9.94	72.14	12.71	8.82	69.40	122.5	5,630	16.3
C. P. 177	14.91	11.39	76.39	13.62	9.97	73.20	145.9	5,957	13.7

[1] Plots of one-fortieth of an acre.

TABLE 4.—*Results of plant-cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1929; planted October 19, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ± 0.19 ton]

Variety	Acre yield of cane from—												Average
	Plot [1] 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	19.20	23.12	20.58	21.50	21.80	21.52	21.90	20.34	18.34	22.40	20.20	21.80	21.06
P. O. J. 36–M	17.92	22.28	20.02	23.92	20.54	19.24	21.48	18.68	20.64	22.64	20.30	23.00	20.90
P. O. J. 213	20.28	19.10	19.14	21.60	21.12	21.16	20.32	22.78	20.40	23.60	20.20	19.00	20.72
P. O. J. 234	22.50	19.18	18.42	22.30	20.30	23.34	21.40	19.12	21.88	20.16	22.40	18.80	20.81
C. P. 177	17.84	20.80	21.22	21.66	21.12	22.72	21.54	21.04	27.28	22.80	21.40	19.00	21.53
C. P. 807 [2]	42.00	33.80	35.80	42.00	43.20	39.40	34.00	39.60	34.20	34.40	37.70	34.40	37.54

Variety	Laboratory-mill juice analyses at harvest, Dec. 4			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	15.10	11.82	78.28	153.7	3,237	13.0
P. O. J. 36–M	15.16	11.93	78.59	155.8	3,256	12.8
P. O. J. 213	15.00	12.14	80.93	161.2	3,340	12.4
P. O. J. 234	15.99	13.07	81.74	174.4	3,629	11.5
C. P. 177	15.28	11.79	77.16	152.0	3,273	13.2
C. P. 807	16.30	13.13	80.55	173.7	6,521	11.5

[1] Plots of one-fortieth of an acre.
[2] Windrowed and covered with dirt Nov. 29, 1929. Cane weighed Feb. 18, 1930. Analyses made on Dec. 4, 1929.

TABLE 5.—*Results of plant-cane variety tests on light soil on the Cypremort plantation, Louisa, La., in 1929; planted October 25, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±0.99 ton]

Variety	Acre yield of cane from—												Average
	Plot [1] 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	20.12	27.60	24.04	26.12	28.72	22.62	16.70	23.74	29.54	22.92	15.00	24.38	23.45
P. O. J. 36-M	24.50	28.30	20.92	32.36	20.12	31.96	27.58	26.58	18.24	27.80	21.84	22.38	25.21
P. O. J. 213	26.38	25.00	20.72	22.88	28.36	25.20	24.78	26.54	26.14	20.86	13.00	29.14	24.08
P. O. J. 234	24.88	24.26	24.72	20.50	23.80	26.08	24.60	22.26	27.56	15.10	21.84	23.30	23.24
P. O. J. 2725													[2] 26.46
Co. 281	23.60	29.94	19.66	23.02	17.68	28.54	23.22	24.26	21.22	20.96	24.02	23.66	23.31

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses, Oct. 25			Harvest analyses, Nov. 21					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	16.10	12.49	77.58	16.45	13.57	82.49	181.9	4,266	11.0
P. O. J. 36-M	16.90	13.58	80.36	16.82	13.97	83.06	187.9	4,737	10.6
P. O. J. 213	15.30	11.89	77.71	15.87	13.17	82.99	177.2	4,267	11.3
P. O. J. 234	18.00	15.04	83.56	17.75	15.27	86.03	209.6	4,871	9.5
P. O. J. 2725	15.90	12.53	78.80	15.74	12.43	78.97	162.7	4,305	12.3
Co. 281	17.10	13.72	80.23	17.64	15.15	85.89	207.7	4,841	9.6

[1] Plots of one-fortieth of an acre.
[2] Average of 8 plots, some badly damaged as the result of surreptitious cutting for "chewing" purposes.

TABLE 6.—*Results of plant-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted October 27, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±0.77 ton]

Variety	Acre yield of cane from—					
	Plot 1 [1]	Plot 2	Plot 3	Plot 4	Plot 5	Average
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	38.64	37.32	35.24	30.82	31.86	34.78
P. O. J. 36-M	37.16	32.96	35.00	32.30	30.12	33.51
P. O. J. 213	35.96	33.60	37.08	29.28	30.72	33.33
C. P. 177	41.30	37.80	34.42	33.20	30.08	35.36
C. P. 807	43.32	42.48	42.46	40.94	43.26	42.49
Co. 281	38.54	37.86	32.38	33.66	28.86	34.26

[1] Plots of one-fortieth of an acre.

TABLE 6.—*Results of plant-cane variety tests on mixed soil, at the United States Sugar Plant Field Station, Houma, La., in 1929; planted October 27, 1928*—Continued

Variety	Laboratory-mill juice analyses												Fiber in cane	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses									Harvest analyses, Dec. 4						
	Oct. 18			Nov. 4			Nov. 26									
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity		Per ton of cane	Per acre	
		Per cent			*Per cent*			*Per cent*			*Per cent*		*Per cent*	*Lbs.*	*Lbs.*	*Tons*
P. O. J. 36	12.70	8.45	66.54	13.85	9.85	71.12	14.53	10.75	73.99	14.74	10.93	74.15	13.2	137.5	4,782	14.5
P. O. J. 36-M	12.60	8.35	66.27	13.88	10.00	72.10	14.62	10.81	73.94	14.70	10.96	74.56	14.8	138.2	4,631	14.5
P. O. J. 213	12.90	8.83	68.45	14.00	10.45	74.64	14.60	11.31	77.47	14.98	11.73	78.31	11.8	152.5	5,083	13.1
C. P. 177	13.80	9.74	70.58	14.65	11.08	75.63	15.00	11.20	74.67	15.33	11.69	76.26	16.1	149.5	5,286	13.4
C. P. 807	12.70	8.98	70.71	14.11	10.59	75.06	14.96	11.68	78.08	15.11	11.92	78.89	15.0	156.0	6,628	12.8
Co. 281	13.50	9.47	70.15	14.85	11.19	75.36	15.91	12.54	78.82	15.77	12.44	78.89	13.6	162.5	5,567	12.3

TABLE 7.—*Results of plant-cane variety tests on heavy soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted November 20, 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±2.03 tons]

Variety	Acre yield of cane from—				
	Plot 1 [1]	Plot 2	Plot 3	Plot 4	Average
	Tons	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36-M	31.28	26.00	26.78	31.40	28.86
P. O. J. 213	38.58	33.50	20.84	27.88	30.20
C. P. 177	36.50	34.74	32.40	27.18	32.70
C. P. 807	37.44	46.64	41.62	41.06	41.69
Co. 281	29.82	29.00	32.20	29.68	30.19

Variety	Laboratory-mill juice analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses						Harvest analyses, Dec. 5					
	Oct. 19			Nov. 13								
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per ct.			*Per ct.*			*Per ct.*		*Lbs.*	*Lbs.*	*Tons*
P. O. J. 36-M	14.40	10.77	74.79	15.00	11.79	78.60	15.88	12.91	81.30	171.8	4,958	11.6
P. O. J. 213	14.70	11.51	78.30	15.43	12.66	82.05	15.85	13.26	83.66	179.2	5,412	11.2
C. P. 177	14.70	10.97	74.63	15.15	11.66	76.97	15.06	11.47	76.16	146.6	4,794	13.6
C. P. 807	13.20	9.85	74.62	14.45	11.48	79.45	15.20	12.23	80.46	161.6	6,737	12.4
Co. 281	15.10	11.40	75.50	15.70	12.63	80.45	16.68	13.84	82.97	186.2	5,621	10.7

[1] Plots of one-fortieth of an acre

TABLE 8.—*Results of plant-cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted November 10, 1928*

Variety	Acre yield of cane from—				Average
	Plot 1[1]	Plot 2	Plot 3	Plot 4	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 213	39.92	33.96	37.78	32.36	36.00
P. O. J. 2354	----------	28.22	----------	----------	28.22
P. O. J. 2878	----------	36.04	40.04	----------	38.04
C. P. 71-B	35.76	38.60	30.48	35.38	35.05
C. P. 130	40.54	39.36	39.92	39.20	39.75
C. P. 766	36.26	36.28	26.10	----------	32.88

Variety	Laboratory-mill juice analyses									Fiber in cane	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses						Harvest analyses, Dec. 3						
	Oct. 18			Nov. 11									
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity		Per ton of cane	Per acre	
		Pct.			*Pct.*			*Pct.*		*Pct.*	*Lbs.*	*Lbs.*	*Tons*
P. O. J. 213	13.52	9.92	73.38	14.84	11.87	79.99	15.38	12.54	81.54	11.8	167.3	6,023	12.0
P. O. J. 2354	13.70	10.15	74.09	14.50	11.21	77.31	15.21	11.99	78.83	------	156.7	4,422	12.8
P. O. J. 2878	13.20	8.66	65.61	14.70	10.97	74.63	15.22	11.37	74.71	------	143.6	5,463	13.9
C. P. 71-B	14.00	10.28	73.43	14.80	11.20	75.68	15.47	12.02	77.70	------	155.6	5,454	12.9
C. P. 130	14.30	10.39	72.66	14.67	10.97	74.78	15.63	12.11	77.48	------	156.6	6,225	12.8
C. P. 766	14.67	10.58	72.12	15.42	11.66	75.62	16.09	12.25	76.14	16.6	156.6	5,149	12.8

[1] Plots of one-fortieth of an acre.

TABLE 9.—*Average cane yields and indicated sugar yields from plant cane of important varieties as indicated by test field results*

Variety	Eastern results (average of Houma, Raceland, and Greenwood tests)[1]			Western results (average of Cypremort and Erath tests)			General results[1]		
	Cane per acre	Indicated available 96° sugar		Cane per acre	Indicated available 96° sugar		Cane per acre	Indicated available 96° sugar	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
	Tons	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	34.27	139.9	4,794	22.25	167.8	3,734	29.47	151.1	4,453
P. O. J. 36-M	34.61	144.7	5,008	23.05	171.8	3,960	29.99	155.5	4,663
P. O. J. 213	35.49	148.6	5,274	22.40	169.2	3,790	30.25	156.9	4,746
P. O. J. 234	[2] 31.84	[2] 165.8	[2] 5,276	22.02	192.0	4,228	26.93	178.9	4,818
P. O. J. 2725	[3] 45.96	[3] 122.5	[3] 5,630	[4] 26.46	[4] 162.7	[4] 4,305	36.21	142.6	5,164
C. P. 177	[5] 38.09	[5] 147.7	[5] 5,626	[6] 21.53	[6] 152.0	[6] 3,273	32.57	149.1	4,856
C. P. 807	[7] 43.46	[7] 156.9	[7] 6,819	[6] 37.54	[6] 173.7	[6] 6,521	41.49	162.5	6,742
Co. 281	[7] 35.40	[7] 175.2	[7] 6,202	[4] 23.31	[4] 207.7	[4] 4,841	31.37	186.0	5,835

[1] Not weighted for local number of replications.
[2] Raceland and Greenwood only.
[3] Greenwood only.
[4] Cypremort only.
[5] Greenwood and Houma only.
[6] Erath only.
[7] Raceland and Houma only.

P. O. J. 36 continues to show comparatively low sucrose content and purity, particularly in the eastern parishes. At Greenwood and Houma sugar yields of only 130.2 and 137.5 pounds, respectively, per ton of plant cane were indicated. At Cypremort, however, where conditions seemed more favorable to ripening, a yield of 181.9 pounds of sugar per ton of plant cane was indicated. The yields of cane are approximately equal to those of P. O. J. 36–M and generally under those obtained with P. O. J. 213, though at Greenwood P. O. J. 36 outyielded P. O. J. 213 by 4.73 tons of cane—a difference which appears to be significant locally.

P. O. J. 36–M continues to yield more sugar per ton of cane and per acre than P. O. J. 36, in some cases equaling or slightly surpassing P. O. J. 213 in sugar per ton of cane, but with slightly lower yields of cane per acre.

P. O. J. 213 shows a generally satisfactory percentage of sucrose and maintains its usual lead over P. O. J. 36 and P. O. J. 36–M in yields of cane and sugar per acre. This variety suffers considerably from borer damage and is subject to severe lodging in rich soil or under conditions of overfertilization. The consequent depression in sugar content from these two causes and the increased cost of harvesting badly lodged cane have caused this variety to come in for a considerable amount of criticism during the past season. However, this variety, in experiments covering the greater portion of the cane belt, shows an average yield of cane per acre and an indicated yield of sugar per ton of cane considerably greater than the yields from P. O. J. 36 and slightly in excess of the yields from P. O. J. 36–M.

P. O. J. 234 generally fell below the above-mentioned three varieties in yield of plant cane per acre in each of the four tests, but as a result of its consistently higher sugar content surpassed them in total sugar production per acre at Cypremort and Erath. At Raceland it surpassed P. O. J. 36 and P. O. J. 36–M but fell below P. O. J. 213, and at Greenwood it fell below each of the varieties. The average results (Table 9) of the four tests show that it surpassed not only P. O. J. 36 and P. O. J. 36–M but also slightly surpassed P. O. J. 213 in sugar production per acre.

C. P. 807 continues to lead all other varieties in cane yield, producing consistently about 40 tons per acre. Even at Erath, where generally depressed cane yields were obtained, C. P. 807 yielded at the rate of 37.54 tons per acre. The indicated sugar yield per ton of plant cane of C. P. 807 compares favorably with yields obtained with P. O. J. 213 and 36–M, while the consistently high yields of cane per acre obtained with this variety result in an indicated yield of sugar per acre exceeding that from any of the varieties in the four variety tests in which it was included. The results of the mill test at Raceland (Table 21) however, place Co. 281 slightly in the lead in total sugar per acre for this test. In the four tests C. P. 807 showed a consistently large lead over P. O. J. 213 in total sugar production, the difference ranging from 1,158 pounds at Raceland (Table 2), where C. P. 807 yielded 7,015 pounds of sugar per acre, to 1,545 pounds at Houma (Table 6), where it yielded at the rate of 6,628 pounds of sugar per acre. The exceptional difference in yield of 3,181 pounds at Erath was occasioned by the much lower than average yield of cane of P. O. J. 213 at this place.

Co. 281 displayed considerably more merit than was indicated by preliminary tests previously conducted. In each of the four tests in which Co. 281 and P. O. J. 213 were included the yields of cane per acre for the two varieties were practically identical, but the higher indicated yields of sugar per ton of Co. 281 resulted in this variety's outyielding P. O. J. 213 in pounds of sugar per acre by a considerable margin. The results obtained from these four experiments (Tables 2, 5, 6, and 7) are not assembled in a single table, but the average results show that Co. 281 gave an average calculated yield of 5,724 pounds of sugar per acre, or 569 pounds more than P. O. J. 213, with an average cane yield per acre of 31.08 tons, as compared with 31.22 tons from P. O. J. 213. At Raceland (Table 2) it gave a total indicated yield of 6,868 pounds of sugar per acre from an average yield of 36.55 tons of cane, as compared with 5,857 pounds of sugar per acre from an average yield of 37.26 tons of P. O. J. 213. The yield of sugar per ton of cane of this variety is decidedly higher than that of P. O. J. 36, P. O. J. 36–M, or P. O. J. 213, and compares favorably with that obtained with P. O. J. 234.

C. P. 177 averages about on a par with P. O. J. 36, but in several tests it compared favorably with P .O. J. 213 and P. O. J. 36–M. However, the results with this variety are much lower than the results with C. P. 807 and Co. 281 and indicate that it will hardly prove to be a commercial variety. During the past year this variety proved very susceptible to the Pokkah Bong disease, which seriously interfered with its growth, particularly in the Houma tests (Tables 6 and 7), and which probably accounts for the comparatively lower yields of cane obtained.

P. O. J. 2725 was included in plantation tests at Greenwood and Cypremort. (Tables 3 and 5.) This variety continues to give satisfactory cane yields, but the indicated sugar yields per ton of cane, 122.5 and 162.7, respectively, on these two plantations were considerably lower than those obtained from P. O. J. 36.

In a test conducted at the United States Sugar Plant Field Station at Houma (Table 8) several varieties of previously undetermined merit were compared with P. O. J. 213.

C. P. 766, which had given large cane yields and a rather high indicated sugar production per acre in a single plot test in 1928, fell below P. O. J. 213 in both cane yield and sugar content.

C. P. 71–B, though showing fair cane and sugar yields, also fell slightly below P. O. J. 213 with respect to both.

P. O. J. 2878 gave a cane yield of 38.04 tons per acre, but its indicated sugar yield of 143.6 pounds per ton of cane on December 3, as compared with 167.3 pounds for P. O. J. 213, indicates that this variety will probably not ripen sufficiently under Louisiana conditions to claim commercial consideration.

The comparatively good cane yield of 39.75 tons per acre obtained with C. P. 130 places this variety above P. O. J. 213 in indicated yield of sugar per acre in spite of its lower sucrose content. Observations conducted on a small plot of stubble cane of this variety, however, indicate very poor stubbling qualities.

P. O. J. 2354 gave a lower yield of cane per acre than P. O. J. 213, with a lower sucrose content.

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MILL TESTS

The results of mill tests conducted with plant cane of P. O. J. 213 and C. P. 807 at the Southdown factory, Houma, and with plant cane of P. O. J. 213, C. P. 807, and Co. 281 at the Godchaux factory, Raceland, are given in Tables 10 and 11. As will be noted, normal extractions from C. P. 807, while slightly under those from P. O. J. 213, were comparatively satisfactory. No difficulty was experienced in milling this cane, and the indications are that good results can be obtained in milling cane of this variety with the equipment usually found at Louisiana factories.

TABLE 10.—*Special mill test on two sugarcane varieties at the Southdown factory,*[1] *Houma, La.*

[Cane cut Dec. 3, and milled Dec. 10, 1929]

Variety	Weight of cane	Weight of juice	Extraction [2]	Normal juice			Acidity, normal juice
				Brix	Sucrose	Purity	
	Pounds	*Pounds*	*Per cent*		*Per cent*		
P. O. J. 213	19,590	14,800	75.54	14.50	11.11	76.62	4.3
C. P. 807	19,130	13,988	73.12	14.35	10.90	75.96	4.0

[1] Acknowledgment is made of the cooperation received from the owners and from Thomas Lowe, chief chemist, of the Southdown factory.
[2] Dry milling.

TABLE 11.—*Results of mill tests on three important sugarcane varieties at the Godchaux sugar factory,*[1] *Raceland, La., in 1929*

[Sample of dilute juice on C. P. 807 was not properly taken and is not used in the calculations listed. The dilute juice analysis listed for this test was assumed, the assumption being based upon the similarity of the crusher juice and residual juice on this test, samples of which were taken properly, to the crusher juice and residual juice on the P. O. J. 213 tests. Maceration, grinding rate, and dilute extraction were practically the same in both cases. Temperature at Raceland, Dec. 2 and 3, 25° F. Cane cut Dec. 8 and milled Dec. 9, 1929]

Variety	Cane milled	Juice analyses												Fiber in cane	Maceration [3]
		Crusher juice			Normal juice			Dilute juice			Residual juice				
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity		
	Tons		*Per cent*			*Per cent*			*Per cent*			*Per cent*		*Per cent*	*Per cent*
Co. 281	9.09	16.10	13.61	84.54	15.80	12.99	82.23	12.27	10.09	82.23	5.81	4.50	77.45	10.17	28.41
P. O. J. 213	9.61	14.44	11.88	82.27	14.17	11.26	79.45	11.97	9.51	79.45	5.67	4.34	76.54	13.26	22.97
C. P. 807	12.19	14.54	11.88	81.71	14.27	11.27	78.95	11.97	9.45	78.95	5.82	4.44	76.29	14.24	22.71

Variety	Normal extraction [3]	Sucrose extraction	Sucrose in cane	Yields of cane per acre [4]	Sucrose in cane per acre	96° sugar per ton of cane [5]	96° sugar per acre	Cane for 1 ton of sugar
			Per cent	*Tons*	*Pounds*	*Pounds*	*Pounds*	*Tons*
Co. 281	83.81	94.78	11.49	36.55	8,399	203.09	7,423	9.85
P. O. J. 213	81.41	91.60	10.00	37.26	7,452	167.75	6,250	11.92
C. P. 807	79.23	92.08	9.70	44.43	8,619	162.83	7,235	12.28

[1] Acknowledgment is made of the cooperation received from the owners of the Godchaux factory, from Horace Nelson, manager, and from W. Bondurant, chief chemist.
[2] Based on venturimeter readings.
[3] Based on weight of mixed juice less maceration water.
[4] See Table 2.
[5] 96° sugar yields based on actual extraction, Java formula, and boiler-house efficiency 98 per cent.

At Raceland, Co. 281 gave a normal extraction of 83.81 per cent, as compared with 81.41 from P. O. J. 213, but the percentage of maceration was higher, and more information is needed before it can be definitely established that Co. 281 is superior in this respect.

Sugar yields for the three varieties in the Raceland mill test were also calculated according to the laboratory method previously referred to.[6] Cane samples were collected from the field on the day that the test was harvested and taken to the Houma laboratory, where the cane was milled and the juice analyzed on the same day that the mill test was conducted. For the purpose of comparison, the sugar yield per ton of cane of the different varieties, calculated from the data obtained in the mill test and also from data obtained on corresponding cane milled at the laboratory, are given in Table 12. The available sugar results calculated from laboratory-mill juice and upon a basis of the normal juice extraction actually obtained at the Raceland mill agree very well with available sugar results calculated by the Raceland mill staff from analyses of mill normal juice and mill extractions, whereas the results calculated from laboratory-mill juice and upon a basis of an assumed normal juice extraction of 78 per cent are decidedly conservative when compared with the latter. In either case the relative values for sugar yields per ton of cane for the different varieties are consistent. These results agree with similar data obtained in 1928 and published in a previous circular.[7] The percentage of normal juice extraction obtained by various commercial mills varies, depending upon equipment and milling efficiency, but no difficulty should be encountered in translating results based upon a 78 per cent extraction to results that may be expected in any individual mill. It appears advisable, therefore, to continue to express all experimental results upon a conservative basis of 78 per cent until such time as accumulated results of mill tests and mill data may justify a change.

TABLE 12.—*Comparison of results of sugar calculations on the varieties of sugarcane in the Raceland test, based upon laboratory and factory data*

Variety	Calculated available 96° sugar per ton of cane based upon—		
	Raceland-mill juice analyses, actual mill extraction, Java formula, B. H. E. number=98	Laboratory-mill juice analyses, and normal juice extraction actually obtained at the Raceland mill	Laboratory-mill juice analyses, and assumed normal juice extraction of 78 per cent on cane
	Pounds	*Pounds*	*Pounds*
P. O. J. 213	[1] 167.7	164.1	157.2
Co. 281	[1] 203.1	201.9	187.9
C. P. 807	[1] 162.8	160.5	158.0

[1] Calculated by a member of the Raceland factory staff.

DETERIORATION STUDIES

One plot of each variety in the plant-cane variety test at the United States Sugar Plant Field Station (Table 6) was left in the field for deterioration observations. Half of each plot was windrowed on the

[6] See Experimental methods, p. 3. [7] See footnote 5, p. 3.

morning of December 6, after a freeze of 24° F. on December 4, and the other half left standing. Table 13 gives the results of analyses made on the standing and on the windrowed cane in this experiment at various dates. The standing cane showed considerable deterioration by the time this part of the experiment was terminated on December 17, but the windrowed cane kept remarkably well until January 16, or for a period of nearly six weeks. All of the varieties showed comparatively low initial purities.

TABLE 13.—*Results of analyses conducted on windrowed and standing cane of different varieties at the United States Sugar Plant Field Station, Houma, La.*[1]

Variety	Analyses Dec. 5, 1929 [2]			Analyses Dec. 10, 1929 [3]				Analyses (average) Dec. 17, 1929			
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	pH	Brix	Sucrose	Purity	pH
		Per cent			*Per cent*				*Per cent*		
C. P. 807:											
Standing	15.11	11.92	78.89	14.50	11.44	78.90	5.65	14.20	10.69	75.25	5.16
Windrowed [4]				15.50	12.01	77.49	5.52	15.45	12.10	78.32	5.41
P.O. J. 36-M:											
Standing	14.70	10.96	74.56	13.60	10.47	76.99	5.57	12.80	9.55	74.61	5.45
Windrowed [4]				14.10	9.98	70.78	5.67	14.60	10.57	72.40	5.71
P. O. J. 36:											
Standing	14.74	10.93	74.15	13.00	9.64	74.16	5.69	13.50	9.90	73.34	5.37
Windrowed [4]				13.90	9.88	71.08	5.52	14.10	10.12	71.78	5.37
Co. 281:											
Standing	15.77	12.44	78.89	14.70	11.56	78.64	5.71	14.10			5.54
Windrowed [4]				16.10	12.74	79.13	5.65	15.90	12.65	79.56	5.54
P. O. J. 213:											
Standing	14.98	11.73	78.31	14.40	11.34	78.75	5.26	12.55	8.89	70.84	4.78
Windrowed [4]				14.30	11.00	76.93	5.63	14.65	11.40	77.82	5.42
C. P. 177:											
Standing	15.33	11.69	76.26	13.40	9.65	72.02	5.55	13.10	9.55	72.90	5.25
Windrowed [4]											

Variety	Analyses (average) Jan. 9, 1930				Analyses (average) Jan. 16, 1930			
	Brix	Sucrose	Purity	pH	Brix	Sucrose	Purity	pH
		Per cent				*Per cent*		
C. P. 807:								
Standing	11.45			3.98				
Windrowed [4]	14.55	9.95	68.39	4.34	15.70	11.62	74.01	5.13
P. O. J. 36-M:								
Standing	11.70			3.96				
Windrowed [4]	15.80	11.12	70.38	5.33	14.15	9.71	68.62	4.58
P. O. J. 36:								
Standing	11.85			3.96				
Windrowed [4]	14.25	9.40	65.97	4.76	14.55	9.87	66.69	5.10
Co. 281:								
Standing	11.90			3.96				
Windrowed [4]	14.65	11.71	79.93	4.70	15.55	12.10	77.81	4.77
P. O. J. 213:								
Standing	11.55			3.96				
Windrowed [4]	15.83	11.95	75.49	4.66	13.90	9.81	70.58	4.67
C. P. 177:								
Standing	11.80			4.00				
Windrowed [4]	14.60	9.78	66.99	4.60				

[1] Freeze of 24° F. on Dec. 4.
[2] Average of 6 plots.
[3] Samples from single plots.
[4] Windrowed on the morning of Dec. 6.

FIRST-STUBBLE CANE VARIETY TESTS

Realizing the importance of producing cane of high sugar content, planters are more and more focusing their attention on the stubble crop. Good stubbling qualities in a variety usually indicate a higher proportion of high-quality cane, and because of the less frequent plantings required should result in lower cost of production. During

the recent epidemic of mosaic ,stubble crops of the old susceptible varieties were of very questionable value on account of the progressive or cumulative effect of the disease and the curtailment of stubble yields to a point unprofitable to harvest, but with the mosaic-tolerating varieties the stubbles have again assumed primary importance.

The results of studies which were made on the first-stubble cane from variety tests in 1927–28 previously reported [8] are assembled in Tables 14 to 18, inclusive, and a summary of the first-stubble results is given in Table 19.

TABLE 14.—*Results of first-stubble cane variety tests on light soil on the Godchaux plantation, Raceland, La., 1929; planted October 26–27, 1927*

[The generalized probable error for differences in average yield of cane per acre among the different varieties=±0.90 ton]

Variety	Acre yield of cane from—												Average
	Plot 1 [1]	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	32.55	33.35	31.90	34.25	31.15	31.55	38.15	28.10	31.65	31.05	32.05	32.80	32.38
P. O. J. 36-M	31.33	31.68	36.08	28.18	31.08	32.50	33.58	28.58	29.83	29.53	31.73	------	31.28
P. O. J. 213	37.60	37.55	34.50	37.95	37.25	37.00	36.25	38.35	34.85	32.20	32.80	34.50	35.90
P. O. J. 228	30.49	26.79	25.24	25.49	29.24	28.94	26.99	28.64	28.24	27.59	23.29	28.24	27.43
P. O. J. 234	24.94	25.90	26.90	27.90	29.15	29.40	30.65	29.75	26.30	28.75	29.00	25.90	27.88
P. O. J. 979	25.61	31.26	25.61	25.36	29.61	34.96	31.36	27.36	31.51	24.81	27.11	28.11	28.55

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses, Oct. 21			Harvest analyses, Nov. 14					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	14.20	10.38	73.10	14.99	11.74	78.32	152.7	4,944	13.1
P. O. J. 36-M	15.30	11.95	78.11	15.56	12.57	81.43	168.8	5,280	11.8
P. O. J. 213	14.70	11.58	78.78	15.30	12.37	80.85	164.0	5,888	12.2
P. O. J. 228	14.00	9.00	64.28	14.34	10.69	74.55	134.7	3,695	14.8
P. O. J. 234	16.00	12.87	80.44	16.47	13.79	83.73	186.6	5,202	10.7
P. O. J. 979	14.60	10.29	70.48	15.32	11.67	76.18	149.2	4,260	13.4

[1] Plots of one-twentieth of an acre.

TABLE 15.—*Results of first-stubble cane variety tests on light soil [a] on the Greenwood plantation, Thibodaux, La., in 1929; planted October 31, 1927*

[The generalized probable error for differences in average yield of cane per acre among the different varieties=±0.79 ton]

Variety	Acre yield of cane from—												Average
	Plot 1 [b]	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	39.75	40.05	34.35	37.55	43.65	40.85	35.45	33.35	39.35	41.65	30.35	35.55	27.66
P. O. J. 36-M	35.61	38.71	34.81	41.61	40.51	36.11	35.31	34.61	34.81	36.91	------	33.91	36.63
P. O. J. 213	42.90	40.10	42.70	41.70	38.50	41.20	35.00	42.00	40.00	39.10	42.50	41.20	40.57
P. O. J. 228	33.62	35.82	33.42	33.62	35.62	35.92	35.02	32.12	34.22	28.72	33.22	34.62	33.83
P. O. J. 234	32.75	32.35	34.25	32.55	31.55	31.05	32.75	32.15	28.85	31.95	30.75	30.65	31.80
P. O. J. 979	35.72	42.42	37.12	40.52	34.52	41.82	33.52	40.22	36.32	35.42	39.92	32.92	37.54
P. O. J. 2725	------	------	------	------	------	------	------	------	------	------	------	------	31.85
Louisiana Purple	------	------	------	------	------	------	------	------	------	------	------	------	18.38

[a] Fertilized at the rate of 200 pounds of calcium cyanamid 4 per acre.
[b] Plots one-twentieth of an acre.

[8] See footnote 5, p. 3

TABLE 15.—*Results of first-stubble cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1929; planted October 31, 1927*—Continued

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses, Oct. 22			Harvest analyses, Nov. 11					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	14.10	10.59	75.11	14.64	11.15	76.16	142.5	5,367	14.0
P. O. J. 36-M	15.00	11.44	76.27	15.38	12.07	78.48	157.1	5,755	12.7
P. O. J. 213	14.60	11.27	77.19	15.08	12.15	80.57	160.8	6,524	12.4
P. O. J. 228	13.10	8.81	67.25	13.60	9.80	72.06	120.9	4,090	16.5
P. O. J. 234	16.70	13.69	81.98	16.60	13.93	83.92	188.7	6,000	10.6
P. O. J. 979	14.90	10.55	70.81	15.28	11.41	74.67	144.2	5,413	13.9
P. O. J. 2725	12.90	8.80	68.22	14.10	10.20	72.34	125.9	4,010	15.9
Louisiana Purple	12.80	9.42	73.60	12.67	9.05	71.43	110.9	2,038	18.0

TABLE 16.—*Results of first-stubble cane variety tests on light soil* [1] *on the Cypremor plantation, Louisa, La., 1929; planted in November, 1927*

[The generalized probable error for differences in average yield of cane per acre among the different varieties=±1.05 tons]

Variety	Acre yield of cane from—											Average
	Plot 1 [2]	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	25.59	21.50	22.82	30.85	33.42	23.34	22.20	29.79	26.56	20.96	23.22	25.48
P. O. J. 36-M	22.47	26.77	17.29	24.40	18.76	26.72	27.23	22.79	27.61	27.12	23.59	24.07
P. O. J. 213	23.80	28.34	25.25	20.04	23.72	26.72	21.77	20.72	30.27	29.63	22.77	24.82
P. O. J. 228	20.39	23.19	18.49	20.35	21.89	24.18	20.65	19.52	20.49	16.40	20.59	20.56
P. O. J. 234	22.61	22.79	20.11	22.53	22.96	13.70	13.42	22.70	11.16	26.90	23.65	20.23
P. O. J. 826	------	25.79	22.33	22.26	21.53	16.65	25.23	22.03	25.27	25.73	26.45	23.33
P. O. J. 979	24.24	16.95	18.25	22.26	19.75	25.32	19.78	24.93	21.54	24.87	21.84	21.79

Variety	Laboratory-mill juice analyses						Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses, Oct. 25			Harvest analyses, Nov. 21					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
		Per cent			*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	16.30	13.40	82.22	16.44	13.62	82.85	183.0	4,663	10.9
P. O. J. 36-M	16.30	13.58	83.31	16.94	14.31	84.48	194.5	4,682	10.3
P. O. J. 213	15.00	11.93	79.53	15.85	13.14	82.90	176.8	4,388	11.3
P. O. J. 228	14.40	10.73	74.52	15.00	11.37	75.80	145.0	3,046	13.8
P. O. J. 234	17.20	14.55	84.59	17.77	15.34	86.33	210.9	4,266	9.5
P. O. J. 826	14.80	11.50	77.70	15.64	12.40	79.29	162.6	3,793	12.3
P. O. J. 979	15.30	11.64	76.08	16.02	12.53	78.22	163.0	3,552	12.3

[1] Cane fertilized with nitrate of soda applied at the rate of 200 pounds per acre.
[2] Plots of one-twentieth of an acre.

TABLE 17.—*Results of first-stubble cane variety test on light soil on the Caldwell plantation, Erath, La., in 1929; planted November 21, 1927*

Variety	Yields of cane per acre [1]	Laboratory-mill juice analyses at harvest, Oct. 30			Calculated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	19.57	16.02	12.73	79.46	167.1	3,270	12.0
P. O. J. 36-M	18.30	16.36	13.08	79.95	172.2	3,151	11.6
P. O. J. 213	20.22	15.80	12.97	82.09	173.5	3,508	11.5
P. O. J. 228	16.65	15.70	11.96	76.18	152.8	2,544	13.1
P. O. J. 234	20.96	17.88	15.05	84.17	204.1	4,278	9.8
P. O. J. 979	18.93	16.70	12.35	73.95	154.9	2,932	12.9
P. O. J. 2714	7.39	13.30	8.86	66.62	102.9	760	19.4
P. O. J. 2725	16.24	15.55	11.74	75.50	149.3	2,425	13.4
P. O. J. 2727	13.56	14.08	10.17	68.72	125.6	1,703	15.9

[1] Average of 7 to 11 replications. Plots were not weighed separately, hence experimental error can not be determined.

TABLE 18.—*Results of first-year stubble cane variety tests on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted November 22, 1927*

Variety	Acre yield of cane from—										Average
	Plot 1 [1]	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
P. O. J. 36	30.28	31.56	37.52	28.32	34.00	------	------	------	------	------	32.34
P. O. J. 36-M	35.68	29.78	38.62	33.46	31.00	------	------	------	------	------	33.71
P. O. J. 213	------	------	------	------	------	31.80	40.02	41.72	34.34	35.18	36.61
Co. 281	24.58	------	38.56	33.38	34.12	------	------	------	------	------	32.66
C. P. 71-B	------	------	------	------	------	22.28	27.96	------	27.68	27.30	26.30
C. P. 123	------	------	------	------	------	22.54	26.20	35.76	27.66	24.30	27.29
C. P. 177	31.78	32.84	32.30	30.50	29.08	28.94	32.54	37.48	29.06	33.00	31.75
C. P. 807	40.32	44.84	48.98	43.46	36.56	------	------	------	------	------	42.83
U. S. 1444 [2]	------	------	------	------	------	24.46	22.16	27.56	32.28	27.08	26.71
C. P. 766	------	------	------	------	------	------	------	------	------	------	[3] 39.74

Variety	Laboratory-mill juice analyses									Fiber in cane [4]	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses						Harvest analyses, Nov. 8				Per ton of cane	Per acre	
	Sept. 27			Oct. 16									
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity				
		P. ct.			*P. ct.*			*P. ct.*		*P. ct.*	*Lbs.*	*Lbs.*	*Tons*
P. O. J. 36	13.31	9.68	72.74	15.00	11.73	78.47	15.99	13.05	81.61	------	174.1	5,630	11.5
P. O. J. 36-M	14.00	10.69	76.36	15.70	12.69	80.83	16.87	14.06	83.34	------	189.9	6,401	10.5
P. O. J. 213	13.76	10.20	74.13	15.20	12.02	79.08	16.30	13.73	84.23	13.5	186.2	6,817	10.7
Co. 281	13.94	10.50	75.32	16.10	13.01	80.81	17.03	14.23	83.56	12.9	192.1	6,274	10.4
C. P. 71-B	13.79	10.42	75.56	15.30	12.19	79.67	16.72	13.93	83.31	------	187.9	4,942	10.6
C. P. 123	------	------	------	14.10	10.55	74.82	15.04	11.79	78.39	------	153.6	4,192	13.0
C. P. 177	13.16	9.34	70.98	15.00	11.32	75.47	16.31	13.09	80.26	------	172.7	5,483	11.6
C. P. 807	13.20	10.30	78.03	14.40	11.37	78.96	15.34	12.36	80.58	15.5	163.5	7,003	12.2
U. S. 1444	------	------	------	13.70	9.24	67.45	15.86	11.76	74.15	------	147.9	3,950	13.5
C. P. 766	14.56	10.91	74.93	16.30	12.53	76.87	17.10	14.38	84.09	16.5	195.0	7,749	10.3

[1] Plots of one-fortieth of an acre.
[2] U. S. = U. S. Department of Agriculture best selections from Canal Point seedlings.
[3] Single plot one-sixtieth of an acre.
[4] By direct analysis on shredded cane. Average of determination on 6 samples.

TABLE 19.—*Average cane yields and indicated sugar yields from stubble cane of important varieties in tests grouped by sections, also general average for all test fields*

Variety	Eastern results (average of Houma, Raceland, and Greenwood tests) [1]			Western results (average of Cypremort and Erath tests)			General results (average of all tests) [1]		
	Cane per acre	Indicated available 96° sugar		Cane per acre	Indicated available 96° sugar		Cane per acre	Indicated available 96° sugar	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
	Tons	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	34.13	156.4	5,338	22.52	175.0	3,941	29.49	163.9	4,833
P. O. J. 36–M	33.87	171.9	5,822	21.18	183.3	3,882	28.80	176.5	5,083
P. O. J. 213	37.69	170.3	6,419	22.52	175.1	3,943	31.62	172.3	5,448
P. O. J. 234	[2] 29.84	187.6	5,598	20.59	207.5	4,272	25.22	197.6	4,983
P. O. J. 979	[2] 33.04	146.7	4,847	20.36	158.9	3,235	26.70	152.8	4,080
C. P. 807	[3] 42.83	163.5	7,003				[3] 42.83	163.5	7,003
Co. 281	[3] 32.66	192.1	6,274				[3] 32.66	192.1	6,274

[1] Not weighted for local number of replications.
[2] Raceland and Greenwood only.
[3] Houma only.

Comparison of the first-stubble results obtained with the four released varieties, P. O. J. 36, P. O. J. 36–M, P. O. J. 213, and P. O. J. 234, shows that P. O. J. 213 still leads the other three in sugar production per acre, while P. O. J. 234 still maintains its foremost position with reference to sugar per ton of cane. P. O. J. 36–M maintained its superiority to P. O. J. 36 in sucrose content, but afforded slightly lower stubble yields. P. O. J. 36 continues to show the lowest sucrose content, but in the western parishes, where cane seems to ripen more satisfactorily, this variety again made a relatively better showing. At Cypremort (Table 16) P. O. J. 36 and P. O. J. 213 afforded practically the same yield of cane per acre, but P. O. J. 36 outyielded P. O. J. 213 in sugar production per acre by 275 pounds. In this experiment a considerable borer infestation was observed, and it is believed that the poor quality of P. O. J. 213 cane was due to the comparatively greater injury suffered by this variety. In this test P. O. J. 36–M shows an indicated yield of sugar per ton of cane surpassing that of P. O. J. 36 by 11.5 pounds, but as a result of the lower yield of cane from P. O. J. 36–M the indicated yield of sugar per acre is practically the same.

At the three eastern test fields, Raceland, Greenwood, and Houma (Tables 14, 15, and 18), P. O. J. 213 outyielded P. O. J. 36 by an average of approximately 1,100 pounds of sugar per acre. In that section the sucrose of P. O. J. 36 first-stubble cane was comparatively low, indicating an average yield of 156.4 pounds of sugar per ton as compared with 170.3 pounds per ton of P. O. J. 213.

P. O. J. 36–M maintained its superiority to P. O. J. 36 in sugar content with slightly lower stubble-cane yields. In the western test fields the difference in cane yield is most apparent, but even with the lower cane yield P. O. J. 36–M practically equaled P. O. J. 36 in sugar production per acre, as shown by the average of Cypremort and Erath results. (Table 19.) In the three eastern test fields (Table 19) it yielded an average of 484 pounds of sugar more than P. O. J. 36, with a slightly lower yield of cane.

Stubble of P. O. J. 234 was relatively better than in previous years. This variety, although considerably lower than the others in cane yields, because of its high sugar content ranked higher than P. O. J. 36 in sugar production per acre and almost equaled P. O. J. 36–M. It should be remembered, however, that conditions during the past season were unusually favorable to stubbling. Under such conditions many of the inherent weaknesses of a variety are frequently masked, and the results are not to be taken as necessarily representative.

P. O. J. 979 showed its usual late-maturing qualities, low sucrose content, and comparatively low cane yields.

Stubble cane of the following varieties was available at Houma only (Table 18), but with the exception of C. P. 766 it is believed that the number of replicated plots was sufficient to afford fairly reliable comparisons.

C. P. 807 proved a strong stubbler, giving an average first-stubble cane yield at Houma (Table 18) of 42.83 tons per acre. The yield of sugar per ton of cane was disappointing, indicating, under conditions assumed, recoveries of 163.5 pounds of sugar per ton of first-stubble cane on November 8, as compared with 186.2 pounds for P. O. J. 213. By referring to Table 18 it will be noted, however, that on September 27 C. P. 807 showed the highest purity of all varieties in the test. The analysis on that date indicated a recovery of 134 pounds of 96° sugar per ton of cane, as compared with 127 pounds for P. O. J. 213. On October 16, assuming yields of cane obtained at harvest, C. P. 807 showed an indicated yield of 6,339 pounds of sugar per acre and 148 pounds per ton of cane, as compared with 5,748 pounds of sugar per acre and 157 pounds of sugar per ton of cane for P. O. J. 213. These figures indicate that C. P. 807 would have made a relatively better showing had the test been harvested earlier. This, coupled with its apparent ability to withstand early cutting, may prove very important in connection with the earlier grinding which will undoubtedly have to be resorted to in order to cope with large crops and freeze dangers incidental to late harvesting. The results of sugar analyses of C. P. 807 in earlier years have not indicated such differences in sugar per ton of cane in favor of P. O. J. 213 and P. O. J. 36–M, and it may be possible that the unusual excess of rain during the normal ripening period in 1929 stimulated C. P. 807 to continue vegetative growth on the light soil in which the tests were conducted to a greater degree than was the case with the other two varieties.

Co. 281, under conditions prevailing during the past growing season, proved to be one of the best stubblers of the varieties under observation. While the stubble-cane figures for this variety (Table 18) are not exceedingly impressive, showing an average yield of 32.66 tons of cane per acre, it must be remembered, as previously pointed out,[9] that a thin and scattered stand was secured with this variety as a result of the thin planting resorted to on account of the scanty supply of seed cane available in the fall of 1927. The stubble-cane yield shows an increase of 7.35 tons over the yield obtained with the original plant cane, and the indicated yield of 192.1 pounds of sugar

[9] See footnote 5, p. 3.

per ton of cane makes its calculated yield of sugar per acre 6,274 pounds, in spite of poor stand and consequently low yields.

C. P. 177 appeared to be a considerably weaker stubbler than P. O. J. 213 or C. P. 807, yielding less cane per acre than either of these varieties and, although indicating a slightly greater yield of sugar per ton of stubble cane than C. P. 807, very much less sugar per acre.

C. P. 766 made a rather remarkable showing, both in point of cane tonnage and indicated sugar per ton of cane and per acre. The results are not to be taken too seriously, however, in view of the fact that tonnage figures are based on observations conducted on a single plot, and may not be at all representative.

C. P. 71–B slightly surpassed P. O. J. 213 in indicated sugar yield per ton of cane, but yielded much less cane and sugar per acre.

C. P. 123 and U. S. 1444 stubbled poorly, as shown by the low average yields of cane of 27.29 and 26.71 tons, respectively, and again indicated low yields of sugar per ton of cane.

SECOND-STUBBLE CANE VARIETY TESTS

Table 20 summarizes the results of second-stubble variety tests conducted on the Caldwell plantation at Erath, La. While it is impossible to arrive at the significance of differences in cane yields between varieties without a knowledge of individual plot weights, P. O. J. 36, P. O. J. 36–M, and P. O. J. 213 made comparatively good showings. P. O. J. 234 was almost a complete failure as second stubble.

TABLE 20.—*Results of second-stubble cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1929*

Variety	Average acre yields of cane	Laboratory-mill juice analyses at harvest, Oct. 30			Calculated available 96° sugar		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons [1]		*Per cent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36	15.34	16.22	12.50	77.07	161.0	2,470	12.4
P. O. J. 36–M	15.14	16.26	12.33	75.83	157.2	2,380	12.7
P. O. J. 213	12.30	15.36	11.93	77.67	154.5	1,900	12.9
P. O. J. 228	14.95	(2)					
P. O. J. 234	5.35	(2)					
P. O. J. 979	11.47	(2)					

[1] Average of 4 to 8 checkerboard replications. Plots were not weighed separately, and experimental error can not be determined.

[2] No analyses on second-year stubble.

MISCELLANEOUS COMPARATIVE VARIETY DATA

In order to arrive at a basis of comparison as to size and weight of stalk of some of the important sugarcane varieties, studies were conducted on cane of each of the five varieties mentioned in Table 21. The figures given are based on an average of 200 stalks of plant cane of each variety picked out at random from plots in the same experiment and under comparable conditions of growth, and cut as for

milling purposes. While average weight and length of stalk will vary with a given variety under different conditions of growth, the relative values given in the table should be fairly representative.

TABLE 21.—*Comparative data obtained as a result of studies conducted on plant cane of five important varieties of sugarcane under Louisiana conditions*

Variety	Average length of stalk	Average weight per stalk	Weight per linear foot of stalk	Amount of cane to plant 1 acre (2 running stalks, rows 5¾ feet apart)
	Feet	*Pounds*	*Pounds*	*Tons*
C. P. 807	8.16±0.014	2.330±0.010	0.2856	2.1636
P. O. J. 213	6.49± .012	1.630± .005	.2512	1.9030
P. O. J. 36-M	7.11± .002	2.335± .010	.3284	2.4878
P. O. J. 234	6.49± .013	1.550± .007	.2389	1.8098
Co. 281	6.66± .010	1.950± .006	.2928	2.2182

FIELD-PRACTICE STUDIES

It has been fully established that satisfactory yields of cane can readily be produced with the varieties now under cultivation, but the experience of most of the planters with low-purity cane and its rapid deterioration following the freeze of last season showed that every effort should be made to improve the quality of the crop by producing cane of the maximum sucrose content and purity. Furthermore, with the factories already taxed to capacity, it would seem logical in the future to attach more importance to an increase in quality rather than in quantity of cane.

It has already been pointed out [10] that the results of past experiments indicate that P. O. J. 213 does best if planted considerably earlier than the dates on which the now abandoned varieties of Louisiana Purple and D–74 were usually planted. While there was a considerable difference in yield of cane in favor of the earlier plantings, the greatest difference observed was in the sucrose content, which was in favor of early planting. Table 22 gives a résumé of plant-cane results previously obtained [10] in a date-of-planting test with P. O. J. 213 and shows results obtained with the first stubble of the same experiment. The table also gives a 2-year summary of the test. These results show that while yields of stubble cane for the different planting dates are not significantly different, yields of sugar per ton of stubble cane were slightly higher in favor of early planting, making the total sugar production per acre for the combined plant and first-stubble cane crops still greater in favor of early planting. The question as to what modification of other field practices may prove beneficial, particularly in connection with the improvement of quality of cane, naturally arises.

[10] See footnote 5, p. 3.

TABLE 22.—*Results of date-of-planting tests with P. O. J. 213 plant cane on mixed soil at the United States Sugar Plant Field Station, Houma, La., in 1928 and 1929*

[Generalized probable error for differences between averages = ±0.76 ton. All plots fertilized with a 4:12:4 mixture (P:N:K) applied at the rate of 400 pounds per acre]

Date planted	Plant-cane results [1]			First-stubble results—acre yield of cane [2]					Average
	Average yield per acre	Indicated available 96° sugar Nov. 26, 1928		Plot 1 [2]	Plot 2	Plot 3	Plot 4	Plot 5	
		Per ton of cane	Per acre						
1927	*Tons*	*Pounds*	*Pounds*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	
Oct. 4	42.07	161.0	6,773	27.17	30.82	35.74	35.95	30.94	32.12
Oct. 17	42.09	158.0	6,650	30.66	37.13	33.19	35.15	34.17	34.06
Nov. 1	38.95	132.2	5,149	32.20	33.28	34.69	34.51	31.61	33.26
Nov. 15	40.24	135.6	5,457	32.09	33.86	36.17	30.54	31.05	32.74
Dec. 6	36.69	123.0	4,513	31.29	31.95	34.38	32.13	31.56	32.26

Date planted	Chemical analyses of stubble cane at harvest, Oct. 23, 1929			Indicated available 96° sugar		Cane for 1 ton of sugar	2-year results (sum of plant and first-stubble cane yields)	
	Brix	Sucrose	Purity	Per ton of cane	Per acre		Average acre yield of cane	Indicated available 96° sugar per acre
1927		*Per cent*		*Pounds*	*Pounds*	*Tons*	*Tons*	*Pounds*
Oct. 4	16.00	13.01	81.31	173.1	5,560	11.6	74.19	12,333
Oct. 17	15.80	12.80	81.01	170.0	5,790	11.8	76.15	12,440
Nov. 1	15.60	12.67	81.22	168.6	5,608	11.9	72.21	10,757
Nov. 15	15.50	12.49	80.58	165.2	5,409	12.1	72.98	10,866
Dec. 6	15.80	12.77	80.82	169.4	5,465	11.8	68.95	9,978

[1] U. S. Dept. Agr. Circ. 88.

[2] Plots of one-twentieth of an acre.

Preliminary plant-cane tests were conducted with several important varieties of sugarcane to determine the most desirable time for planting, the most desirable rate of planting, and the most desirable width for spacing the rows. While the results are not conclusive in view of the fact that they are based on a single year's experiments carried out on but one soil type, the following tabulated summaries and statements relative to the progress of the work may be of interest.

Four replicated plantings of C. P. 177, C. P. 807, and Co. 281 were made at different dates between October 4 and December 28, 1928. A summary of the results is given in Table 23. In all cases plantings made on October 4 showed considerably higher sugar, and in the case of C. P. 807 a higher yield of cane.

TABLE 23.—*Summary of date-of-planting tests with C. P. 177, C. P. 807, and Co. 281 plant cane on mixed soil at the United States Sugar Plant Field Station, Houma, La.*

Date planted	C. P. 177			C. P. 807			Co. 281		
	Average acre yield of cane [1]	Indicated available 96° sugar at harvest, Nov. 19, 1929		Average acre yield of cane [2]	Indicated available 96° sugar at harvest, Nov. 19, 1929		Average acre yield of cane [3]	Indicated available 96° sugar at harvest, Nov. 19, 1929	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
1928	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
Oct. 4	31.01	148.5	4,605	52.05	147.0	7,651	35.30	174.3	6,153
Oct. 25	28.00	129.7	3,632	46.88	140.1	6,568	35.38	163.9	5,799
Nov. 17	35.50	133.3	4,732	47.89	133.9	6,412	35.46	165.3	5,862
Dec. 28	33.03	129.4	4,274	34.57	127.8	4,418	35.73	163.8	5,853

[1] Average of 10 plots 5½ by 18½ feet. The generalized probable error of differences=±1.21 tons.
[2] Average of 10 plots 5½ by 18½ feet. The generalized probable error of differences=±1.64 tons.
[3] Average of 10 plots 5½ by 18½ feet. The generalized probable error of differences=±0.96 ton.

Width-of-row tests were conducted with P. O. J. 36–M, Co. 281, and C. P. 807 on rows varying in width from 4½ to 6 feet. The results are given in Table 24. With the possible exception of Co. 281, no significant differences in yields of cane per acre and in sugar per ton of cane and per acre appear to exist between rows of different widths. The differences do not appear to be sufficiently great to justify the additonal expense involved in growing cane in the narrower rows.

TABLE 24.—*Summary of width-of-row tests with P. O. J. 36–M, C. P. 807, and Co. 281 plant cane on light soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted November 5, 1928*

[Each plot consisted of four rows of the same width each 17.5 feet long. The two outside rows were discarded at harvest in order to minimize possible border effect. Results are based upon harvest data for the two inside rows only]

Width of rows	P. O. J. 36–M			C. P. 807			Co. 281		
	Average acre yield of cane [1]	Indicated available 96° sugar at harvest, Nov. 27, 1929		Average acre yield of cane [2]	Indicated available 96° sugar at harvest, Nov. 27, 1929		Average acre yield of cane [3]	Indicated available 96° sugar at harvest, Nov. 27, 1929	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
	Tons	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
4½ feet	34.49	150.4	5,187	44.82	150.9	6,763	36.43	175.4	6,390
5 feet	32.30	152.0	4,910	45.07	158.2	7,130	34.49	170.7	5,887
5½ feet	34.10	156.9	5,350	48.16	156.9	7,556	34.82	174.0	6,059
6 feet	33.14	148.5	4,921	45.15	153.8	6,944	33.45	178.8	5,981

[1] Average of 7 plots. The generalized probable error of differences=±1.30 tons.
[2] Average of 7 plots. The generalized probable error of differences=±1.35 tons.
[3] Average of 7 plots. The generalized probable error of differences=±0.90 ton.

Table 25 summarizes rate-of-planting tests conducted with P. O. J. 213, C. P. 807, and Co. 281. In these tests the quantity of cane planted varied from one to three running stalks (approximately 1 to 3 tons per acre, depending upon the variety). Stands from one running-stalk planting were comparatively thin and gappy. The sucrose content of the cane was lower in every case than that of cane of the same variety from plots planted at a thicker rate. The yield of cane was also lower in the one running-stalk series, resulting in considerably reduced sugar production per acre. In the case of C. P. 807 and Co. 281, increasing the rate of planting from two running stalks, the usual rate of planting in Louisiana, to three running stalks resulted in additional increases in yield of cane per acre and in available sugar per ton of cane, but more extensive experiments will have to be conducted to establish definitely the value of the differences and their economic importance.

TABLE 25.—*Summary of rate-of-planting tests with P. O. J. 213, C. P. 807, and Co. 281 plant cane on light soil at the United States Sugar Plant Field Station, Houma, La., in 1929; planted November 17–20, 1928*

Rate of planting [1]	P. O. J. 213			C. P. 807			Co. 281		
	Average acre yield of cane [2]	Indicated available 96° sugar at harvest, Nov. 20, 1929		Average acre yield of cane [3]	Indicated available 96° sugar at harvest, Nov. 20, 1929		Average acre yield of cane [4]	Indicated available 96° sugar at harvest. Nov. 20, 1929	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
	Tons	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
1 running stalk	27.17	141.4	3,842	36.63	153.4	5,619	25.05	175.2	4,389
2 running stalks	30.64	152.2	4,663	44.64	153.3	6,843	28.23	182.7	5,158
3 running stalks	30.32	151.0	4,578	48.40	155.8	7,541	30.06	185.7	5,582

[1] In all cases sound seed cane almost free from borers was used.
[2] Average of 20 replicated single-row plots each 18½ feet long. Rows spaced 5½ feet apart. Generalized probable error of differences = ±0.77 ton.
[3] Average of 20 replicated single-row plots each 18½ feet long. Rows spaced 5½ feet apart. Generalized probable error of differences = ±1.30 tons.
[4] Average of 20 replicated single-row plots each 18½ feet long. Rows spaced 5½ feet apart. Generalized probable error of differences = ±0.78 ton.

SUMMARY AND CONCLUSIONS

P. O. J. 213, both as plant cane and as stubble, continues to be the leading one of the four released varieties from the standpoint of cane and sugar yield per acre and adaptability to Louisiana conditions. This variety, however, lodges very badly in exceptionally rich soil or under conditions of overfertilization and has been the subject of considerable criticism on that score.

P. O. J. 234, while affording lower yields of both plant and stubble cane per acre than P. O. J. 213, continues to lead in yield of sugar per ton of cane. From the standpoint of yield of sugar per acre it compared favorably with P. O. J. 213 and exceeded it in several instances. The first-stubble crop in particular made a comparatively better showing than in previous years. Conditions were unusually favorable to stubbling, however, and the yields of first-stubble cane, judging from its performance in the past, are not to be taken as representative. In view of the comparatively early ripening of P. O. J. 234, it appears

desirable to plant a certain percentage of the acreage to this variety, in order to provide cane suitable for grinding early in the season when the other released varieties are still too green for profitable sugar production.

P. O. J. 36 continues to ripen late and while affording comparatively good results in the western part of the sugar belt appears to be the least desirable of the four released varieties.

P. O. J. 36–M ripens earlier than P. O. J. 36 and appears to be distinctly better adapted to Louisiana conditions. The plant-cane yields of the two varieties show practically no differences, but the stubble yields of P. O. J. 36–M are slightly lower than those of P. O. J. 36 and indicate that it may be a slightly weaker stubbler. However, both the plant and stubble crops show a yield of considerably more sugar per ton and per acre than P. O. J. 36. It would appear, therefore, that P. O. J. 36–M should be planted in preference to P. O. J. 36, and that if it continues to perform as it has in the past it should entirely replace that variety. The larger diameter of the stalk, comparative freedom from lodging, and apparently better borer resistance of P. O. J. 36–M indicate that it could probably be substituted to advantage for P. O. J. 213 on a part of the acreage now planted to this variety.

Co. 281 plant cane gave considerably better results than those obtained from the very limited trials which had previously been carried on. This variety almost equaled P. O. J. 234 in indicated yield of sugar per ton of cane. It equaled P. O. J. 213 in yield of plant cane per acre and on account of its much higher sucrose and purity afforded indicated yields of sugar per acre varying from 200 to 1,000 pounds greater than the yields from that variety. Stubble-cane results are too limited to permit of conclusions being drawn, but the results of a single comparative test show 192.1 pounds of sugar per ton, 32.66 tons of cane per acre, and 6,274 pounds of sugar per acre from Co. 281, as compared with 186.2 pounds of sugar per ton, 36.61 tons of cane per acre, and 6,817 pounds of sugar per ton from P. O. J. 213. The lower yield of cane from Co. 281 was undoubtedly due to the fact that this variety had been thinly planted, and observations indicate that its stubbling qualities are fully equal, if not superior, to those of P. O. J. 213.

C. P. 807 again gave remarkably high yields of cane per acre, both as plant cane and as stubble. The sucrose content of the plant cane compared favorably with that of P. O. J. 213, while the much higher yield of cane resulted in indicated yields of sugar per acre varying from 1,000 to 1,500 pounds greater than the yields from the latter variety. Stubble-cane results are too limited to permit of conclusions being drawn, but the results of a single comparative test show 163.5 pounds of sugar per ton, 42.83 tons of cane per acre, and 7,003 pounds of sugar per acre from C. P. 807, as compared with 186.2 pounds of sugar per ton, 36.61 tons of cane per acre, and 6,817 pounds of sugar per acre from P. O. J. 213. The stubbling qualities of C. P. 807 appear to be distinctly superior to those of P. O. J. 213.

Mill tests with Co. 281 and C. P. 807 indicate that no particular difficulty should be encountered in milling cane of these varieties with the milling equipment usually found at Louisiana factories. Both Co. 281 and C. P. 807 appear to be hardy varieties, and their

growth characteristics and desirable qualities as compared with the varieties of cane now grown commercially indicate that they may prove suitable for commercial culture.

Further tests of C. P. 71–B, C. P. 123, C. P. 177, C. P. 766, U. S. 1444, P. O. J. 2354, and P. O. J. 2725 indicate that, with the possible exception of C. P. 766, these varieties will not prove suitable for commercial culture in Louisiana. Tests of P. O. J. 2878 indicate that this variety will not ripen sufficiently under Louisiana conditions to prove of commercial value.

Date-of-planting tests with P. O. J. 213, Co. 281, C. P. 807, and C. P. 177 show that with respect to sugar content in particular these varieties afford better results when planted early in October than when planted later in the fall.

Width-of-row tests with P. O. J. 36–M, Co. 281, and C. P. 807, while too limited in extent to permit of definite conclusions being drawn, indicate that little is to be gained by planting these varieties in rows closer together than the 5½ to 6 foot spacing commonly followed in Louisiana. Rate-of-planting tests, while also too limited in extent to permit of definite conclusions being drawn, with P. O. J. 213, Co. 281, and C. P. 807 indicate the importance of an adequate rate of planting. Two running stalks per row appear to be the minimum quantity of sound seed cane that should be planted.

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